Design strength for panes

Design criteria

General:
Panes are calculated either according to DIN18008 or prEN13474, as indicated for each pane type
Absorption values are as stated by Interpane
Absorption value for LowE panes is 30% or less
Absorption value for Sun1 panes is between 30% and 50%
Absorption value for Sun2 panes is between 50% and 60%
External loads: Snow 1.0 kN/m^2, wind pressure 1.6 kN/m^2, wind suction 2.1 kN/m^2

Design critera specifically for DIN18008
Full name of the standards: DIN 18008:2010. Glas im Bauwesen – Bemsessungs- und Konstruktionsregeln – Teil 1: Begriffe und allgemeine Grundlagen + Teil 2: Linienförmig gelagerte Verglasungen.
DIN EN 1990:2010 + NA:2010. Eurocode: Grundlagen der Tragwerksplanung + Nationaler Anhang.

Desing glass strength (MPa)

Load type / glass quality	Float	Heat str.	Tough.
Wind load	31,5	47	80
Climatic load, snow	18,0	47	80
Permanent load	11,3	47	80

Climatic loads:

Max. temperature difference	Summer	Winter
Absorption < 30%	+20°	-25°
30% < Absorption < 50%	+29°	-25°
Absorption > 50%	+38°	-25°

Max. difference in barometric pressure: 2.0kN/m^2–4.0kN/m^2

Altitude difference:
+600m / -300m (between production facility and installation).

Load combinations

	G	W^{down}	W^{up}	S	C	H
Load combination 1	1.35	1.50	0.00	0.75	0.90	1.00
Load combination 2	1.00	0.00	1.50	0.00	0.90	1.00
Load combination 3	1.35	0.90	0.00	1.50	0.90	1.00
Load combination 4	1.35	0.90	0.00	0.75	1.50	1.00
Load combination 5	1.00	0.00	0.90	0.00	1.50	1.00

In the table above, G is the self weight, W^{down} is wind pressure, W^{up} is wind suction, S is the snow load, C is climatic load from temperature and barometric pressure difference, and H is load from altitude difference. The stated factor in the table is the value a given load must be multiplied by, before it is added to the sum of the other scaled loads in that row.

Loads that are not due to climatic changes or altitude difference (i.e. snow and wind) are denoted external loads.

A maximum allowable design value for external load is given in the table. This value has been determined, assuming an application of the window in the maximum height. The stated value is the full load's projection perpendicular to the pane.

Allowed utilization rate:
Climatic loads dominating: 150%
External loads dominating: 100%

Design strength for panes

Design critera specifically for prEN13474
Full name of the standard: prEN 13474 – Determination of the strength of glass panes – Part 3: General method of calculation and determination of strength of glass by testing. Draft, November 2005.

Desing glass strength (MPa)

Load type / glass quality	Float	Heat str.	Tough.
Wind load	25	46	88
Climatic load, snow	12,5	33	75
Snow load	10,8	32	73
Permanent last	7,3	28	70

Climatic loads:

Max. temperature difference	Summer	Winter
Absorption < 30%	+21°	-28°
30% < Absorption < 50%	+27°	-28°
Absorption > 50%	+30°	-28°

Max. difference in barometric pressure: 2.5kN/m²–2.5kN/m²

Altitude difference:
+200m / -100m (between production facility and installation)
However, the panes are calculated for a application height of 600 meters.

Load combinations:
Loads that are not due to climatic changes or altitude difference are denoted external loads .

Regarding climatic load, a strength utilization has been determined using the load combination: 1,5 x Climatic load.

A maximum allowable design value for external load is given in the table. The stated value is the full load's projection perpendicular to the pane.

When wind load is dominant, full shear transfer is assumed between the laminated glass panes. For all other loading situations, zero shear transfer is assumed..

Allowed utilization rate:
Climatic loads: 160 %
External loads: 100 %

Pane variant	Coating		Description
10	LowE	33.2 laminated inner pane	8H-20Argon-33.2F iplusE
11	SUN1		8H ipasol neutral 50/27-20Argon-33.2F
12	SUN2		8H ipasol platin 25/17-20Argon-33.2F
10T	LowE	55.2 laminated inner pane	8H-16Argon-55.2F iplusE
11T	SUN1		8H ipasol neutral 50/27-16Argon-55.2F
12T	SUN2		8H ipasol platin 25/17-16Argon-55.2F
16	LowE	33.2 laminated inner pane	8H iplusE-12 Argon-8HS-12Argon-33.2F iplusE
17	SUN1		8H ipasol neutral 50/27-12 Argon-8HS-12Argon-33.2F iplusE
18	SUN2		8H ipasol platin 25/17-12 Argon-8HS-12Argon-33.2F iplusE
16T	LowE	55.2 laminated inner pane	8H iplusE-12 Argon-4HS-12Argon-55.2HS iplusE
17T	SUN1		8H ipasol neutral 50/27-12 Argon-4HS-12Argon-55.2HS iplusE
18T	SUN2		8H ipasol platin 25/17-12 Argon-4HS-12Argon-55.2HS iplusE

Design strength for panes

Table of load capacity for panes

Pane variant		675	750	800	900	1000	Standard
10	P_{max} (kN/m²)	6,3	5,6	5,0	3,8	3,1	prEN13474
	H_{max} (m)	250	600	600	600	600	
11	P_{max} (kN/m²)	6,3	5,6	5,0	3,8	3,1	prEN13474
	H_{max} (m)	50	400	600	600	600	
12	P_{max} (kN/m²)	6,3	5,6	5,0	3,8	3,1	prEN13474
	H_{max} (m)	250	600	600	600	600	
10T	P_{max} (kN/m²)	4,0	3,2	2,9	2,3	1,9	DIN18008
	H_{max} (m)	600	600	600	600	600	
11T	P_{max} (kN/m²)	4,0	3,2	2,9	2,3	1,9	DIN18008
	H_{max} (m)	600	600	600	600	600	
12T	P_{max} (kN/m²)	4,0	4,0	2,9	2,3	1,9	DIN18008
	H_{max} (m)	600	600	600	600	600	

		675	750	800	900	1000	Standard
16	P_{max} (kN/m²)	5,5	5,0	4,8	3,7	2,9	DIN18008
	H_{max} (m)	400	500	600	600	600	
17	P_{max} (kN/m²)	5,5	5,0	4,8	3,7	2,9	DIN18008
	H_{max} (m)	100	300	400	600	600	
18	P_{max} (kN/m²)	5,5	5,0	4,8	3,7	2,9	DIN18008
	H_{max} (m)	400	500	600	600	600	
16T	P_{max} (kN/m²)	6,3	5,6	5,2	3,8	3,1	DIN18008
	H_{max} (m)	600	600	600	600	600	
17T	P_{max} (kN/m²)	6,3	5,6	5,2	3,8	3,1	DIN18008
	H_{max} (m)	600	600	600	600	600	
18T	P_{max} (kN/m²)	6,3	5,6	5,2	3,8	3,1	DIN18008
	H_{max} (m)	600	600	600	600	600	

P_{max} (kN/m²) Total maximum applicable external load (design value) excluding self weight of the panel.
H_{max} (m) The maximum altitude the panel may be installed in.

For special sizes – use the values stated for the nearest smaller standard sized skylight.

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